REMARKS

Claims 1-37 were pending in the application. Claims 1, 9, 14, 17, 25, 31 and 37 are amended. Claim 32 is cancelled without prejudice. Claims 38-40 are new. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 1-7, 9-10, 14, 16-18, 20-23, 25-27, 31-33, and 35-36 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Meierbachtol (U.S. Pat. No. 6,275,182). This rejection is respectfully traversed.

Referring to independent claim 1, the claim is amended to recite "...determining at least one offset to signal depolarization induced by the radome; and applying the at least one offset to the signal to reduce depolarization of the signal."

Meierbachtol describes tapering a radome wall to reduce boresight error caused by polarization of RF energy impinging on the radome (col. 1, line 66- col. 2, line 10). Boresight error has two components: crossplane error and inplane error (FIG. 1; col. 1, lines 34-40). Crossplane data changes significantly with RF energy polarization. Inplane data, however, is nearly polarization-insensitive (FIG. 2a; col. 1, lines 52-54). The radome wall taper of Meierbachtol reduces the crossplane error to a minimum. The inplane error is periodic, parametric, predictable and reducible by electronic compensation (col. 2, lines 7-10; col. 3, lines 44-49). The inplane data is averaged to determine average inplane curves for sectors of the radome (col. 3, lines 59- col. 4, line 12). Meierbachtol thus teaches correcting polarization error by applying an offset to

the radome by tapering it, and correcting polarization-insensitive boresight error by applying an offset to the tracking data. A radome tapered as disclosed by Meierbachtol induces little (if any) polarization error in the tracking data (Abstract). Applicant submits that the electronic compensation disclosed by Meierbachtol does not compensate for polarization error, nor could the electronic compensation of Meierbachtol compensate for boresight error induced by a radome not tapered as disclosed by Meierbachtol. Although Meierbachtol may teach applying an offset to a radome wall, Meierbachtol does not teach applying an offset to a signal to compensate for depolarization induced by the radome. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference, arranged as in the claim (MPEP Section 2131).

In contrast, the method recited in claim 1 recites "... from said determined angle of incidence, determining at least one offset to signal depolarization *induced by* the radome; and applying the ... offset *to the signal* to reduce *depolarization* of the signal." In contrast to the method of Meierbachtol, the method recited in claim 1 makes it possible to reduce or eliminate signal depolarization induced by an existing radome without sophisticated high-cost radome redesign (specification, paragraph 95). Applicant therefore respectfully submits that independent claim 1 should be allowed.

Referring to claim 9 (dependent on claim 1), the claim is amended and is supported in the specification. Applicant submits that when the recitations of claims 2-13 (dependent on claim 1) are considered together with the recitations of claim 1, claims 2-13 also should be allowed.

Referring to independent claim 14, the claim is amended to recite "...dividing the signal into a plurality of polarized signals; and applying, to at least one of the polarized signals, at least one offset predetermined based on a difference between a tranverse magnetic (TM) transmission coefficient and a transverse electric (TE) transmission coefficient of the radome, the at least one offset configured to cancel depolarization attributable to the difference."

As previously discussed with reference to claim 1, Meierbachtol discloses correcting for crossplane polarization error by tapering the radome. Meierbachtol applies electronic compensation to tracking data to compensate for polarization-insensitive inplane error in the signal passing through the tapered radome (col. 3, line 36-col. 4, line 54). Thus Meierbachtol teaches applying an offset to compensate for inplane error, but does not teach applying a signal offset to compensate for depolarization induced by the radome. Further, Meierbachtol does not teach "...applying...at least one offset predetermined based on a difference between a ...(TM) transmission coefficient and a ...(TE) transmission coefficient of the radome, the ... offset configured to cancel depolarization attributable to the difference", as recited in amended claim 14. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference, arranged as in the claim (MPEP Section 2131). Claim 14 therefore should be allowed. Claim 17 (dependent on claim 14) also has been amended and is supported by the specification. Applicant submits that when the recitations of claims 15-24 (dependent on claim 14) are considered together with the recitations of claim 14, claims 15-24 also should be allowed.

Referring to independent claim 25, the claim is amended to recite "...an applicator circuit including a plurality of phase shifters having settings configured to shift phases of the oppositely polarized signals to generate polarization of the wireless signal at a desired polarization angle; and a processor in communication with the applicator circuit and configured to determine at least one offset to the polarized signals that compensates for depolarization induced by the radome; the processor further configured to adjust one or more of the phase shifter settings to apply the at least one offset to at least one of the polarized signals to reduce depolarization of the wireless signal."

As discussed with reference to claims 1 and 14, Meierbachtol teaches tapering a radome to minimize polarization error. This taper of the radome minimizes the crossplane boresight error component magnitude, which is polarization sensitive, and produces a polarization insensitive inplane boresight error component (Abstract). Meierbachtol also describes using averaged inplane data to compensate for the polarization-insensitive inplane error. Meierbachtol, however, does not teach electronically compensating for polarization error (if any) induced by the tapered radome.

Accordingly, Meierbachtol does not teach or suggest "a processor in communication with the applicator circuit and configured to determine at least one offset to the polarized signals that compensates for depolarization induced by the radome" and "...to adjust one or more ... phase shifter settings to apply the ... offset to ... the polarized signals to reduce depolarization of the wireless signal". A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or

inherently described, in a single prior art reference, arranged as in the claim (MPEP Section 2131). Claim 25 therefore should be allowed. Applicant also submits that claims 26-30 dependent on claim 25 also should be allowed.

Referring to independent claim 31, the claim is amended to recite "...a processor configured to determine at least one offset to at least one of the polarized signals based on a difference between transverse electric and transverse magnetic transmission coefficients (τ_{TE} and τ_{TM}) of the radome; and an applicator circuit configured to apply the at least one offset to at least one of the polarized signals to cancel depolarization attributable to the difference."

Meierbachtol does not teach an offset based on a difference between transverse electric and transverse magnetic transmission coefficients of the radome. In contrast, and for example, in one embodiment of the antenna system recited in claim 31, depolarization offsets can be determined as described in the specification, paragraphs 37-55. Claim 31 therefore should be allowed. Applicant also submits that claims 32-36 dependent on claim 31 also should be allowed.

REJECTION UNDER 35 U.S.C. § 103

Claim 37 stands rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative under 35 U.S.C. § 103(a) as obvious over Meierbachtol (U.S. Pat. No. 6,275,182) in view of Britt (U.S. Pat. No. 3,805,268). This rejection is respectfully traversed.

Independent claim 37 is amended to recite a "polarization controller for controlling polarization of a wireless signal passing through an antenna having a radome, the controller comprising a signal divider that divides the signal into oppositely

polarized signals, an adjustment circuit that varies a differential phase shift to the polarized signals in accordance with a desired linear polarization plane orientation angle, and at least one processor configured to: determine an angle of incidence of the wireless signal relative to the radome; determine, from the determined angle of incidence, at least one offset to cancel an imbalance between transverse electric (TE) and transverse magnetic (TM) components of the wireless signal induced by the radome; and control the adjustment circuit so as to vary the differential phase shift to apply the offset to the polarized signals."

As previously discussed above, Meierbachtol teaches electronic compensation for polarization-insensitive inplane error, but does not teach electronic compensation for depolarization. Accordingly, it is not inherent in the system of Meierbachtol to control an adjustment circuit so as to vary a differential phase shift to apply an offset to cancel an imbalance between TE and TM components of the signal induced by the radome.

Additionally, Britt discloses a wire grid filter 10 comprising a polarization-sensitive phase shifter. The filter of Britt is "selective" (col. 4, lines 16-21) but is not "variable", in that it does not appear to be adjustable during antenna operation. Thus it would not be obvious or effective to modify the system of Meierbachtol to include the filter of Britt to provide variable phase shifting.

In contrast, the polarization controller of claim 37 includes "...an adjustment circuit that varies a differential phase shift to the polarized signals...and at least one processor configured to ...determine...at least one offset to cancel an imbalance between ...TE...and...TM...components ...induced by the radome; and control the adjustment circuit so as vary the differential phase shift to apply the offset to the

polarized signals." Neither Meierbachtol nor Britt, alone or in combination, teach or suggest the recitations of claim 37. Therefore Applicant submits that claim 37 should be allowed.

Claims 11, 13 and 15 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Meierbachtol (U.S. Pat. No. 6,275,182). This rejection is respectfully traversed.

Referring to claims 11 (dependent on claim 1) and 15 (dependent on claim 14), as previously discussed with reference to claims 1 and 14, Meierbachtol discloses correcting polarization error by tapering the radome but does not teach electronically compensating for polarization error. Additionally, it is admitted in the Office Action that Meierbachtol is silent about resolving radiated field components of the signal into RHCP and LHCP components. Applicant submits that when the recitations of claims 11 and 15 are considered together respectively with the recitations of amended claims 1 and 14, claims 11 and 15 should be allowed.

Referring to claim 13 (dependent on claim 1), it is admitted in the Office Action that Meierbachtol is silent about converting between a radio frequency of the signal and an intermediate frequency using one of a downconverter and an upconverter for the offset signal. As previously discussed, Meierbachtol does not teach electronically compensating for polarization error and thus does not disclose using an offset signal to compensate for depolarization. Accordingly, it would not be obvious in view of Meierbachtol to upconvert or downconvert an offset signal. Applicant submits that when the recitations of claim 13 are considered together respectively with the recitations of amended claim 1, claim 13 should be allowed.

Claims 19 and 24 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Meierbachtol (U.S. Pat. No. 6,275,182) in view of Gratt et al. (U.S. Pat. No. 5,149,011). This rejection is respectfully traversed.

Referring to claim 19 (dependent on claim 14), as discussed above with reference to claim 14, Meierbachtol does not teach applying a signal offset to compensate for depolarization induced by the radome. Further, it is admitted in the Office Action that Meierbachtol does not teach interpolating among a plurality of predetermined amplitude offsets to determine the at least one offset. Applicant submits that claim 19 should be allowed.

Referring to claim 24 (dependent on claim 14), as discussed above with reference to claim 14, Meierbachtol does not teach applying a signal offset to compensate for depolarization induced by the radome. Further, it is admitted in the Office Action that Meierbachtol does not teach determining a differential amplitude. Applicant submits that claim 24 should be allowed.

Claims 28 and 34 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Meierbachtol (U.S. Pat. No. 6,275,182) in view of Rao (U.S. Pat. No. 4,499,473). This rejection is respectfully traversed.

Referring to claim 28 (dependent on claim 25), as discussed above with reference to claim 25, Meierbachtol does not teach or suggest electronically compensating for polarization error (if any) induced by the tapered radome. Further, Meierbachtol does not teach or suggest "a processor in communication with the applicator circuit and configured to determine at least one offset to the polarized signals that compensates for depolarization induced by the radome" and "...to adjust one or

more ... phase shifter settings to apply the ... offset to ... the polarized signals to reduce depolarization of the wireless signal" as recited in claim 25. It is admitted in the Office Action that Meierbachtol is silent about having a phase shifter and an attenuator connected in series. Rao teaches a dome antenna system that compensates for polarization distortion (Abstract). Rao mentions, but does not illustrate, "a system of adjustable attenuators and phase shifters that are set to predetermined values for each scan angle" (col. 5, lines 33-41). As discussed above with reference to claim 1, Meierbachtol does not teach compensating for polarization error (except through radome tapering). Thus it would not have been obvious or useful to combine the system of attenuators and phase shifters (however configured) of Rao with the system of Meierbachtol. Claim 28 should be allowed.

Refering to claim 34 (dependent on claim 31), as discussed above with reference to claim 31, Meierbachtol does not teach an offset based on a difference between transverse electric and transverse magnetic transmission coefficients of the radome, as recited in claim 31. Further, it is admitted in the Office Action that Meierbachtol is silent about having a phase shifter and an attenuator connected in series. As previously discussed with reference to claim 28, it would not have been obvious or useful to combine the system of attenuators and phase shifters (however configured) of Rao with the system of Meierbachtol. Accordingly, claim 34 should be allowed.

Claim 29 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Meierbachtol (U.S. Pat. No. 6,275,182) in view of Claborn et al. (U.S. Pat. No. 5,149,011). This rejection is respectfully traversed.

Referring to claim 29 (dependent on claim 25), as discussed above with reference to claim 25, Meierbachtol does not teach or suggest electronically compensating for polarization error (if any) induced by the tapered radome. Further, Meierbachtol does not teach or suggest "a processor in communication with the applicator circuit and configured to determine at least one offset to the polarized signals that compensates for depolarization induced by the radome" and "...to adjust one or more ... phase shifter settings to apply the ... offset to ... the polarized signals to reduce depolarization of the wireless signal" as recited in claim 25. It is admitted in the Office Action that Meierbachtol is silent about having a pair of phase shifters and a power divider connected to the phase shifters. As discussed above with reference to claim 1, Meierbachtol does not teach compensating for polarization error (except through radome tapering). Thus it would not have been obvious or useful to combine the phase shifter and power divider of Clabon with the system of Meierbachtol to reduce depolarization. Claim 29 should be allowed.

ALLOWABLE SUBJECT MATTER

The Examiner states that claims 8, 12 and 30 would be allowable if rewritten in independent form. Accordingly, Applicant has added claims 38, 39 and 40. New claim 38 includes the recitations of claims 1 and 8. New claim 39 includes the recitations of claims 1, 11 and 12. New claim 40 includes the recitations of claims 25, 29 and 30. Therefore, claims 38-40 should now be in condition for allowance.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (314) 726-7521.

Respectfully submitted,

Dated: February 16, 2005

By: _____

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